REMARKS

Explanation of claim amendments

By this amendment, claims 1, 4, 5, 6, 18, 21, 25, 26 and 28 are amended. Claims 24 and 29 are cancelled. Claims 1-23 and 25-28 remain in the application.

Claim 1 has been limited to claiming the anode in contact with molten electrolyte for electrowinning aluminium from alumina dissolved in the molten electrolyte, i.e. in a cell for the electrowinning of aluminium that contains a molten electrolyte in which alumina is dissolved. Claim 1 has been further amended by replacing the objected-to term "outer part" by "outwardly-facing part". Moreover, the claim has been amended to further specify the "integral oxide layer" namely in terms of this layer being obtainable by subjecting the cobalt-containing metallic outwardly-facing part to an oxidation treatment at a temperature of at least 895°C to form from the cobalt-containing metallic outwardly-facing part said integral oxide layer containing predominantly CoO. Basis for the "at least 895°C" is found in claim 20, for example.

Claims 4, 5, 6, 18, 21 and 28 have been amended for consistency with the new term "outwardly-facing part".

Claim 18 has been aligned with claim 1 by introducing the "at least 895°C" limitation and by specifying the step of contacting the anode with the molten electrolyte.

Claim 25 has been amended to claim the anode of claim 1.

Method claim 26 has been amended to electrowinning aluminium using an anode in a cell as defined in claim 1.

Claim rejections – 35 USC § 112

Claims 1 and 29 were rejected under 35 USC 112, second paragraph, as being indefinite in view of the term "cobalt containing metallic outer part". It was unclear to the Examiner if the outer part was the substrate or not. This term has now been amended in claim 1 to "outwardly-facing" part which is believed to remove the lack of clarity.

Claim 29 was further objected to in respect of which components were being claimed. However, claim 29 has now been cancelled which removes the objections.

Claim objections

Claim 25 was objected to as being of improper dependent form as it was not positively recited that the cell has an electrolyte; it was also objected that processing temperatures are not cell features.

Claim 25 has now been amended to claim an anode in a cell as per claim 1 where claim 1 positively recites the molten electrolyte as a feature, moreover that the molten electrolyte

contains dissolved alumina. The objection that "the cell could be used with other electrolyte" is believed to apply to the original claim wording where the molten electrolyte was not positively claimed. Moreover, the applicants submit that the electrolyte temperature is a technical feature of the molten electrolyte which defines an operative condition of the electrolyte. The applicant therefore respectfully requests that this objection be withdrawn in view of the amendments made.

Claim rejections – 35 USC § 102

Former claims 1, 2, 5, 7-11, 15, 16, 24 and 29 were rejected under 35 USC 102(b) as being anticipated by Kishi et al (US 5,954,928).

The applicants respectfully traverse this objection in respect of the now-amended claims.

Kishi describes an activated cathode capable of electrolyzing a solution of alkali metal salt such as alkali-metal halide, alkali-metal hydroxide or the like with a low hydrogen overvoltage for a long term (col. 1 lines 6-10), See also col. 1 lines 12-38. All of Kishi's examples are aqueous electrolytes at about 80°C.

Kishi has no disclosure or suggestion of aluminium electrowinning; nor using a molten electrolyte containing dissolved alumina, nor of an anode for electrowinning aluminium that is in contact with a molten electrolyte. Claim1 is hence novel over Kishi.

Claim 1 is furthermore novel over Kishi in that claim 1 discloses an "integral oxide layer" containing CoO that is obtainable by oxidising a Co-metal containing outwardly-directed part to form the integral CoO oxide layer.

Kishi describes a cobalt oxide layer, but this is an applied oxide layer that is deposited onto a metal substrate, usually a nickel substrate, eg by thermal spraying (col. 2, line 37).

Kishi's cobalt oxide layer is referred to as "first layer" and is preferably formed by electroplating, electroless plating, dispersive electroplating, thermal spraying or immersion (col. 3, lines 8-11 and col. 4, lines 24-31). It is <u>never</u> formed by oxidising a cobalt-containing outwardly-facing layer. See also Embodiments 25 to 30 (col. 11, lines 44-54) where a cobalt oxide layer was applied on a nickel substrate.

It follows therefore that Kishi does not disclose an "integral cobalt oxide layer on a cobalt-containing substrate", as required by applicants claim 1.

Claim 1 is hence novel over Kishi for this reason, and the same applies to claims 2-23 and 25-28.

Former claims 1, 5, 7-11, 18, 19, 22, 24, 29 were rejected under 35 USC 102(b) as being anticipated by Lim at al (US 5,248,510).

The applicants respectfully traverse this objection in respect of the now-amended claims.

Lim describes cobalt oxide passivation of nickel battery electrode substrates. Lim has no disclosure or suggestion of aluminium electrowinning; nor using a molten electrolyte containing dissolved alumina, nor of an anode for electrowinning aluminium that is in contact with a molten electrolyte. Claim 1 is hence novel over Lim.

Claim 1 is furthermore novel over Lim in that claim 1 discloses an "integral oxide layer" containing CoO that is obtainable by oxidising a Co-metal containing outwardly-directed part to form the integral CoO oxide layer.

It follows that claim 1 is novel over both citations for the reasons stated above. The same applies to claims 2-23 and 25-28.

Non-obviousness – 35 USC § 103

The applicants submit that claim 1 as now amended and all claims of the new amended application are unobvious and inventive over the citations Kishi et al (US 5,954,928) and Lim et al (US 5,248,510) for the following reasons.

The application has been explicitly limited to the electrowinning of aluminium in a cell containing a molten electrolyte in which aluminium is dissolved, and is specifically concerned with an anode for electrowinning aluminium which is in contact with the molten electrolyte and which has an integral CoO-containing outer surface on a cobalt-containing outwardly-facing metallic surface.

Aluminium electrowinning from a molten electrolyte containing dissolved alumina is a specific field of endeavour as explained in the application's Background Art section, page 1, line 7 to page 3, line 4.

Kishi on the other hand relates to aqueous electrolysis of alkali metal salts at about 80°C and is particularly directed to an activated cathode.

The skilled person seeking to improve an anode for electrowinning aluminium from a molten salt electrolyte containing dissolved alumina had no reason to consult Kishi's teaching and, if he did consult it, he would not find the teaching in any way useful for the production of an anode for electrowinning alumina for a molten salt electrolyte containing dissolved alumina. It follows the applicants' claimed invention cannot be reached in any obvious way starting from Kishi.

As regards Lim, his teaching concerns cobalt oxide passivation of nickel battery electrode substrates which is remote from aluminium electrowinning.

The skilled person seeking to improve an anode for electrowinning aluminium from a molten salt electrolyte containing dissolved alumina had no reason to consult Lim's teaching and, if he did consult it, he would not find the teaching in any way useful for the production of an anode

for electrowinning alumina for a molten salt electrolyte containing dissolved alumina. It follows the applicants' claimed invention cannot be reached in any obvious way starting from Lim.

Furthermore, it is evident that no theoretical combination of Kishi and Lim is pertinent to applicants invention, as both these citations are from very different fields.

In addition, neither Kishi nor Lim discloses an integral CoO containing layer on a cobalt-containing metallic outwardly-facing part, as required by applicant's claim 1 and as more fully discussed under novelty.

In summary, the applicants submit that amended claim 1 as well as claims 2-23 and 25-29 are all unobvious and inventive over the Kishi and Lim citations.

Double patenting

The applicants are filing herewith terminal disclaimers in respect of applications N° 10/591,635 and 10/591,634.

Favorable reconsideration is therefore respectfully requested.

Respectfully submitted,

Dated: March 1, 2010

By: _____

Jayadeep R. Deshmukh
Registration No. 34,507
Attorney of Record
(609)688-0202